

ON NIGHT FLYING AND ATTRACTION TO LIGHT  
IN ACRIDIIDÆ AND THE RELATION OF  
METEOROLOGICAL CONDITIONS  
THERE TO

BY L. P. ROCKWOOD

*U. S. Bureau of Entomology, Forest Grove, Oregon*

Published records of night flying and attraction to light in the family Acridiidae of the Orthoptera appear to be few and not readily discoverable. This behavior has been well established for *Dissosteira longipennis* Thomas in Colorado<sup>1</sup> and New Mexico<sup>2</sup> and a recent article<sup>1</sup> would indicate that this species was the only one in the United States known to fly at night. A search of the literature at hand at this moment, however, adds several species to the list of those taken at light at night, and the observation recorded in this paper adds three more.

Riley, Packard, and Thomas<sup>3</sup> were apparently able to find but one authentic case of observation of flight of Acridiidae at night in European literature and mention none for America. They pointed out, however, that circumstantial evidence indicated that migratory flights may be continued after nightfall. A flight of large numbers of grasshoppers, thought to have been *Schistocerca americana* Dru., was noted<sup>4</sup> at a lighthouse in Lake Erie off the mouth of the Detroit River between the hours of 11 and 12 p. m. on the night of July 12, 1899. Mr. W. R. Walton of the U. S. Bureau of Entomology has stated in correspondence, and given permission to quote that, in the vicinity of Washington, D. C., "we frequently find considerable numbers of the Carolina grasshopper, *Dissosteira carolina* Linn., flying around the electric lights during the warm nights of the summer."

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<sup>1</sup> Circular 36, 13th annual report, State Entomologist of Colorado, p. 35, June, 1922. Fort Collins, Colo.

<sup>2</sup> Bulletin 293, U. S. Department of Agriculture, 1915, Washington, D. C.

<sup>3</sup> Second Report, U. S. Entomological Commission, p. 97, 1880, Washington, D. C.

<sup>4</sup> Bulletin 22, n. s., Div. of Ent., U.S.D.A., p. 106, 1900, Washington, D.C.

Rehn and Hebard <sup>5</sup>, <sup>6</sup> have recorded the capture of the following species at light at night in New Mexico and Arizona:

*Encoptolophus texensis* Bruner <sup>6</sup>, 1 ♀, Deming, N. M., July 20, 1917;  
Roswell, N. M., Aug., 1902.

*Derotmema laticinctum* Scudder <sup>6</sup>, 1 ♂, Alamogordo, N. M., July 12, 1907.

*Trimerotropis texana* Bruner <sup>6</sup>, 1 ♀, Alamogordo, N. M., July 12, 1907.  
*rubripes* Rehn <sup>6</sup>, 1 ♀ Alamogordo, N. M., July 12, 1907.

*vinculata* Scudder <sup>6</sup>, Alamogordo, N. M., July 12, 1907.

*vinculata* Scudder <sup>5</sup>, 1 ♂, Nogales, Ariz., Aug. 13.

*fascicula* McNeill <sup>5</sup>, 1 ♀, Nogales, Ariz., Aug. 13.

*strenua* McNeill <sup>5</sup>, 2 specs., Tucson, Ariz., July 26.

*Aeoloplus arizonensis* Scudder <sup>5</sup>, 7 specs., Yuma, Ariz., July 27, 28.

*Melanoplus herbaceus* Bruner <sup>6</sup>, 1 ♀, Alamogordo, N. M., July 12, 1907.

A study of these records indicates that night flying of Acridiidæ may frequently occur in the Southwestern United States, while nocturnal activity in this family would seem to be of rare occurrence in northern latitudes. It is, therefore, thought to be worth while to record the following observation made by the late Prof. A. L. Lovett of the Oregon Agricultural College and the writer, together with pertinent meteorological data.

On the night of July 22, 1923, Professor Lovett and the writer were in the city of Boise, Idaho, after a sweltering day on the train. At about 9:30 or 10 p. m., we decided to take a short stroll in the open air for the purpose of cooling off. Our attention was almost immediately attracted to grasshoppers which were fluttering around the street lamps like moths. Several of the grasshoppers were on the sidewalk where many had been stepped on and mangled by pedestrians and we each collected a double handful of the hoppers from in front of show windows and doorways. These grasshoppers have since been identified by the writer as follows:

*Conozoa wallula* Scudder, 3 ♀ ♀

*Dissosteira spurcata* Sauss., 6 ♂ ♂, 3 ♀ ♀

*Spharagemon æquale* Say, 5 ♂ ♂, 5 ♀ ♀

<sup>5</sup> Proc. Acad. Nat. Sci. Phila. p. 365, 1908.

<sup>6</sup> Proc. Acad. Nat. Sci. Phila., p. 111, 1909.

Clinton E. Norquest, Meteorologist of the Weather Bureau, U. S. Department of Agriculture, Boise, Idaho, has kindly furnished the following meteorological records for July 22, 1923:

<i>Temperature</i>	<i>Wind direction</i>	<i>Relative humidity</i> <sup>7</sup>
89° at 8 p.m.	W at 7 p.m.	25 per cent at 6 p.m.
86° at 9 p.m.	NW at 8 p.m.	
80° at 10 p.m.	N at 9 p.m.	
77° at 11 p.m.	N at 10 p.m.	
maximum for day, 98°	SE at 11 p.m.	

It is the opinion of the writer that the high night temperature was the principal factor occasioning the night flight of grasshoppers in this case, although the relative humidity, wind direction, and the extreme heat of the preceding daylight hours were doubtless also important factors. It is a well known fact that temperature is a prime factor in determining the activity of grasshoppers. Sviridenko<sup>8</sup> and Parker<sup>9</sup> have recently reported that air temperatures in the neighborhood of 80° F. occasion maximum activity in the case of *Doclostaurus maroccanus* Thnb. and *Camnula pellucida* Scudder, respectively. Parker<sup>9</sup> has recorded much valuable data on the relation of meteorological conditions to the behavior of the latter species. In this paper it is stated that migratory flights "did not begin (in Montana) until the air temperature had reached 74° F. and were at their maximum at from 75° F. to 78° F." Other data in the same article indicated that the temperature limiting the inauguration of short flights in Minnesota is near 75° F. Both authors agree that air temperatures in the neighborhood of 90° F. tend to inhibit activity in these species.

<sup>7</sup> A trace of precipitation was recorded for the 23rd, so that the percentage of relative humidity was probably considerably higher at 10 p. m.

<sup>8</sup> Sviridenko, P. A. Petrograd, 1924, rev. in Rev. of Applied Ent., vol. 12, p. 337, 1924.

<sup>9</sup> Bulletin 214, U. of Minn. Agr. Exp. Sta., St. Paul, 1924, p. 32.